

Notice of Allowability

Application No.

10/539,518

Examiner

Rip A. Lee

Applicant(s)

JACOBSEN ET AL.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to March 2, 2007.
2. ☒ The allowed claim(s) is/are 1, 2, and 5-29.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

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| Claim 1, line 10 | replace "and" which appears after the word "atoms" with "or" |
| Claim 5, line 5 | replace "and" which appears after the word "cyano" with "or" |
| Claim 5, line 9 | delete "in a" which appears after the word "neutral" |
| Claim 5, line 16 | replace "and" which appears after the word "aryl," with "or" |
| Claim 12, line 3 | replace "and" which appears after the word "propylene" with "or" |
| Claim 14, line 2 | insert "selected from" between "are" and "1-butene" |
| Claim 14, line 2 | replace "and" which appears after "1-pentene" with "or" |
| Claim 19, line 9 | replace "and" which appears after the word "atoms" with "or" |
| | |
| Claim 20 (page 7), line 3 | replace "and" which appears after the word "cyano" with "or" |
| Claim 20 (page 7), line 7 | delete "in a" which appears after the word "neutral" |
| Claim 20, (page 7), line 14 | replace "and" which appears after the word "aryl," with "or" |
| | |
| Claim 26, line 2 | replace "and" which appears after the word "propylene" with "or" |
| Claim 28, line 1 | insert "selected from" between "are" and "1-" |
| Claim 28, line 2 | replace "and" which appears after "1-pentene" with "or" |

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: Claims 1, 2, and 5-29 are allowed over the closest references cited below.

The present invention is drawn to a supported catalyst system comprising (a) a metallocene having the formula CpMX_n wherein M is a group VIA metal, (b) a non-aluminoxane activator, and (c) a support material comprising an inorganic metal oxide, inorganic metal halide, polymeric material, or mixtures thereof, wherein the support material has been pretreated with a SO_4 containing compound.

A second aspect of the invention is drawn to a supported catalyst comprising (a) a transition metal compound, an activator represented by the formula $(\text{L}^*-\text{H})^{+d} (\text{A}^{d-})$, and (c) a support material comprising an inorganic metal oxide, inorganic metal halide, polymeric material, or mixtures thereof, wherein the support material has been pretreated with a SO_4 containing compound.

McDaniel *et al.* (U.S. 6,107,230 and U.S. 6,300,271), cited previously, and McDaniel *et al.* (U.S. 6,831,141) disclose a different class of catalyst containing sulfated alumina support, trialkylaluminum co-catalyst, and group 4 metallocenes. There is no disclosure of use of group 6 metallocenes or ionic activators as recited in the instant claims.

Gao *et al.* (U.S. 6,734,266) discloses catalysts containing group 4 standard metallocene or phosphimine complexes and aluminoxane co-activator supported on sulfated alumina or sulfated silica. There is no disclosure of use of group 6 metallocenes or non-aluminoxane/ionic activators as recited in the instant claims.

Marks *et al.* (U.S. 6,235,918) and Ahn *et al.* (Organometallics, 2002) discloses catalysts prepared from group 4 metallocenes deposited on sulfated zirconia. Here, the support is sufficiently electrophilic to generate an active site. These catalysts are used for olefin/arene hydrogenation reactions, as well as for polymerization of ethylene. There is no disclosure of use of group 6 metallocenes or non-aluminoxane/ionic activators as recited in the instant claims.

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Sun *et al.* (WO 01/25149) teaches a supported catalyst wherein the support material is prepared by treatment of layered silicate and alkaline metal silicate with H_2SO_4 in order to form a gel containing layered silicate and precipitated silica. The transition metal component is a group 4 metallocene. There is no disclosure of use of group 6 metallocenes or non-aluminoxane/ionic activators as recited in the instant claims.


Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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May 9, 2007


DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700